

Exploring New Frontiers: The Gulf of Mexico's Cetaceans

Just about everybody in the western world has heard of “Flipper” of the old television series, and millions of people have gone to Sea World and other marine aquaria to see Flipper-look-alikes. But do they know that these dolphins - almost all of them coastal bottlenose dolphins - either come from the nearshore waters of the Gulf of Mexico or are offspring of animals from this area?

Dolphins are no longer taken from U.S. waters for aquarium display. The bottlenose dolphins of the channels, bays, inlets, bayous, and river mouths of the Gulf of Mexico hunt for fishes, rear their young, and follow shrimp boats and are enjoyed by fishermen and tourists as a natural and beautiful part of the shallow-water Gulf coastline. There are thousands of them that seem to persist, despite the presence of human activities. They live in some polluted waters, too, such as in Galveston Bay of Texas and near the river outflow of Tampico in Mexico. Researchers such as Dan Cowan of the University of Texas Medical Branch in Galveston have found extremely high rates of tumors and other abnormalities during necropsies of beach-cast animals and these anomalies are possibly, but not definitely, due to long-term build-up of human-produced toxins in the Gulf environment.

The bottlenose dolphin and the West Indian manatee are arguably the most familiar of the Gulf's marine mammal inhabitants due to their coastal nature. The Gulf's bottlenose dolphins have made valuable contributions to the scientific community and general public. Those animals that used to be caught for live display generally came from Mississippi Sound or from south Texas. These dolphins have given many people (including many marine mammal biologists) their first up-close look at a dolphin, as well as given scientists a chance to gain insights into the biology and behavior of the animals, and learn husbandry techniques that have aided many stranded animals. Pioneering studies of free-ranging bottlenose dolphins by Randy Wells in Sarasota Bay, Florida, and Susan Shane in Port Aransas, Texas, and Sanibel Island, Florida, have provided a good deal of what we know about the social and behavioral ecology of bottlenose dolphins, and Wells' 20+ year study of these animals continues to add valuable data. Long-term monitoring of bottlenose dolphins in Texas waters has been conducted since 1990 by Texas A&M University, concentrating research on the behavior, group sizes, movement patterns, site preferences, and - above all - the interactions between human and dolphins. In response to a die-

off of dolphins along the Texas coast in 1992, the National Marine Fisheries Service (NMFS) and Texas A&M worked together to assess the health of free-ranging dolphins by live-capturing individuals in Matagorda Bay, as well as radio-tagging some of these animals to get a better handle on their movement patterns. Some stranded dolphins have been rehabilitated by the Texas Marine Mammal Stranding Network, under the guidance of Graham Worthy who working together with Bruce Mate of Oregon State University, has satellite-tagged dolphins, and provided us with astounding information on their movement patterns. One bottlenose dolphin swam along the south Texas coast to 88 km south of the U.S./Mexico border, making this trek four times before the signal was lost. Another bottlenose dolphin which stranded in Corpus Christi, originally swam 65 km south along the coastline, turned around, and the last tracking signal placed the animal nearshore around Lake Charles, Louisiana (near the Texas border).

Many folks living on the Gulf Coast are often surprised to hear that their own backyard of the Gulf of Mexico is a treasure trove of fascinating marine mammals. The bottlenose dolphin and the Atlantic spotted dolphin are found in the relatively shallow waters over the very wide continental shelf; but in most locations, one would need to travel more than one day out before seeing any other cetacean species.

It's when we get past the shelf with its murky waters into the clear, deep, blue water that an amazing new picture emerges. We continue to see bottlenose dolphins, but this is a different creature than the nearshore variety - a bigger, huskier animal genetically distinct from the nearshore variety - whose social structure and behavioral ecology we know little about. Risso's dolphins also have been frequently sighted along the shelf edge, along the upper slope (<860 m). All other delphinids, the sperm whale and its smaller cousins the pygmy and dwarf sperm whales, as well as beaked whales, appear to prefer deeper slope waters. Most killer whale sightings have been in offshore waters greater than 200 m deep, although there are other sightings from over the continental shelf. It was once thought that cetaceans did not inhabit the deep offshore waters of the Gulf in significant numbers. However, there are records now of 28 cetacean species from the Gulf (20-22 species appear to occur here routinely), which include a number of so-called blackfish (pilot whales, false killer whales, etc.), the killer whale, the occasional baleen whale, a plethora of dolphins, "secretive" beaked whales, and the mighty sperm whale.

Previously, the little that we knew about the Gulf's cetacean species was based on

opportunistic reporting of animals that washed up on the beach (often quite decayed and smelly) and sightings of animals at sea. Entries in whaling logs from as early as the 1840's provided additional information. It was Dave Schmidly in the 1970's who, then an assistant professor at Texas A&M University, established a volunteer-based marine mammal stranding network along the Texas coast. In 1981, he summarized information regarding cetacean distribution, information largely based on strandings. Dave Schmidly can therefore easily be considered the founding father of marine mammal work in the Gulf, with his support of graduate student studies of bottlenose dolphins along the Texas coast in the fledgling days, as well as his efforts to establish the Marine Mammal Research Program at Texas A&M University, and continued support of cetacean research in the Gulf.

While Schmidly's summary provided a good indication of which species were in the Gulf, it really didn't give us an idea of the numbers or habitat preferences of these animals, since stranded animals are usually sick or injured and often out of their normal habitat. The first large-scale aerial surveys for cetaceans in the Gulf were conducted from 1979-1981 by Thomas Fritts and other U.S. Fish and Wildlife Service personnel. Another set of aerial surveys by Steve Leatherwood and other NMFS personnel were being conducted in the 1970's, but these were near the coast, providing much-needed information on bottlenose dolphin abundance, distribution, and behavior.

The first large-scale vessel surveys to assess marine mammal distribution and abundance in the Gulf were conducted by the NMFS beginning in 1990. Much of what we've learned regarding the Gulf's marine mammals is a result of the GulfCet Program, funded largely by the Minerals Management Service (MMS). The MMS, a bureau within the U.S. Department of the Interior, is the agency responsible for managing oil and gas activities on the Outer Continental Shelf in an environmentally sound manner. This recently completed study was jointly conducted by the NMFS, Texas A&M University, and the Texas Institute of Oceanography, and used aerial and shipboard surveys to determine the seasonal and geographic distribution of cetaceans along the continental slope in the north-central and western Gulf. This is an area of future, planned oil and gas lease sales.

By conducting ship-based and aerial surveys, we have made many important discoveries about cetacean distribution and numbers in the Gulf. Some preconceptions about the Gulf's

marine mammals have been confirmed. For example, Schmidly suggested that there might be a year-round (perhaps resident) population(s) of sperm whales. This appears to have been a reasonable assumption based on sperm whales being concentrated in particular areas, such as the region south of the Mississippi River Delta, where we have been finding these animals predictably. We also know, based on photo-ID analyses, that many of the same individual sperm whales are being seen; many of these are mother/calf pairs. On the other hand, some of the other proposed ideas have been discarded. For example, the pilot whale, originally thought to be common (due to historic records, mainly strandings), is in fact not. Several poorly known species, such as beaked whales, pygmy and dwarf sperm whales, and the Clymene dolphin, have turned out to be moderately common. There is very little known about the biology of the Clymene dolphin and, interestingly enough, most of what we know about this species is from Gulf studies. All reported sightings and strandings of common dolphins were determined to be incorrect; many turned out to be those of Clymene dolphins, and the common dolphin is no longer thought to occur in the Gulf. This finding is largely due to the diligent work of Tom Jefferson, who completed an overview of deepwater Gulf cetaceans for his Ph.D. in 1995. Fraser's dolphins and melon-headed whales (both previously unknown to the Gulf before strandings in the early 1990's) have actually been seen in large schools. The pantropical spotted dolphin is the most numerous cetacean species in the Gulf and is often seen in very large schools, numbering upwards of several hundred individuals. Sperm whales are the most common large whale in this body of water. Baleen whales are occasionally reported in the Gulf; the most common is the Bryde's whale. However, for the most part, other baleen whale species sighted are probably individuals (most likely subadults) that have strayed during migrations to breeding grounds (southward) or on their return migrations (northward) to feeding grounds. For example, a young humpback whale was sighted off the Texas coast a few years ago, the first sighting of a humpback whale for the western Gulf.

Some fascinating observations on cetacean behavior made in the Gulf include mixed species schools of dolphins and apparent aggression by pilot whales on a sperm whale group that included calves (the sperm whales went into a defensive position by encircling the calves). And then there are killer whales - few people have seen them in the Gulf, but it turns out that there may be several groups traveling throughout major areas of the Gulf, and perhaps never leaving. The NMFS scientists have seen some of the same killer whale individuals over time, identifying

them by unique shapes or markings in their dorsal fins. An attack by killer whales on a group of pantropical spotted dolphins has also been witnessed.

In addition to using visual survey teams, GulfCet cruises led by Texas A&M University towed an array of hydrophones that have allowed researchers Bill Evans, Jeff Norris, and Troy Sparks to survey cetaceans acoustically. This is a particularly powerful tool for assessing sperm whale distribution, since sperm whales may stay submerged for prolonged periods. The GulfCet cruises also made the first-ever recordings of Fraser's dolphin sounds.

The current GulfCet II study continues to examine cetacean distribution and abundance, expanding farther into the eastern Gulf where future oil/gas leasing is proposed, as well as getting a handle on characterizing the habitats of cetaceans using sophisticated satellite imaging, large net trawls, and hydrographic data. We are finding that sperm whales may be found in conjunction with upwelling events that may enhance productivity and prey abundance. Video cameras ("critter cams") have been attached to sperm whales by Greg Marshall, who is with the National Geographic Society, and short video segments have given us a first look at the world of the sperm whale.

So, we now know more about cetaceans of the Gulf of Mexico than even a few years ago. But much more needs to be known. Although we now know of 28 different species (!), we have only a fuzzy idea how distribution changes with oceanographic conditions, and we do not know the real behavioral and physiological impacts on the animals from variably intensive industrial, fishing, and shipping activities by humans. Finally, we know almost nothing about the marine mammals in the southern portion of the Gulf and in Mexican and west Cuban waters, and it is our challenge to remedy these data gaps before any species or population is threatened by human activities.

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Educators may receive free copies of MMS' "Whales and dolphins of the Gulf of Mexico" poster and the teaching companion by contacting the MMS Public Information Office (1-800-200-GULF).